

INCH POUND

MIL-PRF-19500/181G
16 June 2000
SUPERSEDING
MIL-PRF-19500/181F
30 June 1997

PERFORMANCE SPECIFICATION

SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, LOW-POWER TYPES 2N718A, 2N1613, AND 2N1613L; JAN, JANTX, AND JANTXV

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1. Scope. This specification covers the performance requirements for NPN silicon, low-power transistors. Three levels of product assurance are provided for each device type as specified in MIL-PRF-19500.

1.2. Physical dimensions. Figure 1, (similar to TO-18); figure 2, (similar to TO-39, and TO-5).

1.3. Maximum ratings. Unless otherwise specified, $T_C = +25^\circ\text{C}$.

Type	P_T See note 1 $T_C = +25^\circ\text{C}$	P_T See note 2 $T_A = +25^\circ\text{C}$	V_{CBO}	V_{CEO}	V_{EBO}	I_C	V_{CER} $R_{BE} = 10 \Omega$	$R_{\theta JC}$	$R_{\theta JA}$	T_J and T_{STG}
	<u>W</u>	<u>W</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>	<u>mA dc</u>	<u>V dc</u>	<u>°C/W</u>	<u>°C/W</u>	<u>°C</u>
2N718A	1.8	0.5	75	30	7	500	50	97	325	-65
2N1613	3.0	0.8	75	30	7	500	50	58	175	to
2N1613L	3.0	0.8	75	30	7	500	50	58	175	+200

NOTE:

1 Derate linearly at 17.2 mW/°C for type 2N1613 and 2N1613L and at 10.3 mW/°C for type 2N718A for $T_C > +25^\circ\text{C}$.

2 Derate linearly at 5.7 mW/°C for type 2N1613 and 2N1613L for $T_A > 60^\circ\text{C}$, and at 3.08 mW/°C for type 2N718A for $T_A > +37.5^\circ\text{C}$.

1.4. Primary electrical characteristics.

Limits	h_{FE1} 1/	h_{FE2} 1/	h_{FE3} 1/	h_{FE4} 1/	$V_{CE(SAT)}$ 1/	$ h_{FE} $ at 20 MHz
	$V_{CE} = 10 \text{ V dc}$ $I_C = 0.1 \text{ mA dc}$	$V_{CE} = 10 \text{ V dc}$ $I_C = 10 \text{ mA dc}$	$V_{CE} = 10 \text{ V dc}$ $I_C = 150 \text{ mA dc}$	$V_{CE} = 10 \text{ V dc}$ $I_C = 500 \text{ mA dc}$	$I_C = 150 \text{ mA dc}$ $I_B = 15 \text{ mA dc}$	$V_{CE} = 10 \text{ V dc}$ $I_C = 50 \text{ mA dc}$ $f = 20 \text{ MHz}$
Min Max	20	35	40 120	20	<u>V dc</u> 1.5	3

1/ Pulsed (see 4.5.1).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAC, Post Office Box 3990, Columbus, OH 43216-5000, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-19500 - Semiconductor Devices, General Specification for.

STANDARD

DEPARTMENT OF DEFENSE

MIL-STD-750 - Test Methods for Semiconductor Devices.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Document Automation and Production Services, 700 Robbins Avenue, Building 4D (DPM-DODSSP), Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated specifications or specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

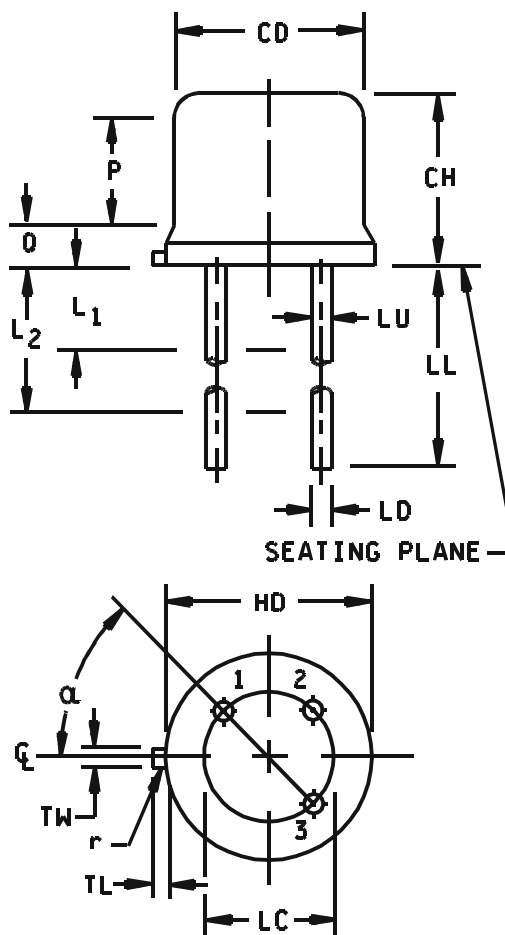
3.1 General. The requirements for acquiring the product described herein shall consist of this document and MIL-PRF-19500.

3.2. Qualification. Devices furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.2 and 6.3).

3.3. Associated detail specification. The individual item requirements shall be in accordance with MIL-PRF-19500 and as specified herein.

3.4. Abbreviations, symbols, and definitions. Abbreviations, symbols, and definitions used herein shall be as specified in MIL-PRF-19500.

Symbol	Inches		Millimeters		Notes
	Min	Max	Min	Max	
CD	.178	.195	4.52	4.95	
CH	.170	.210	4.32	5.33	
HD	.209	.230	5.31	5.84	
LC	.100 TP		2.54 TP		5
LD	.016	.021	0.41	0.53	8, 9
LL	.500	.750	12.70	19.05	7, 9
LU	.016	.019	0.41	0.48	4, 8, 9
L1		.050		1.27	9
L2	.250		6.35		9
TL	.028	.048	0.71	1.22	5
TW	.036	.046	.91	1.17	
P	.100		2.54		3
Q		.030		0.76	6
r		.010		.025	
α	45° TP		45° TP		

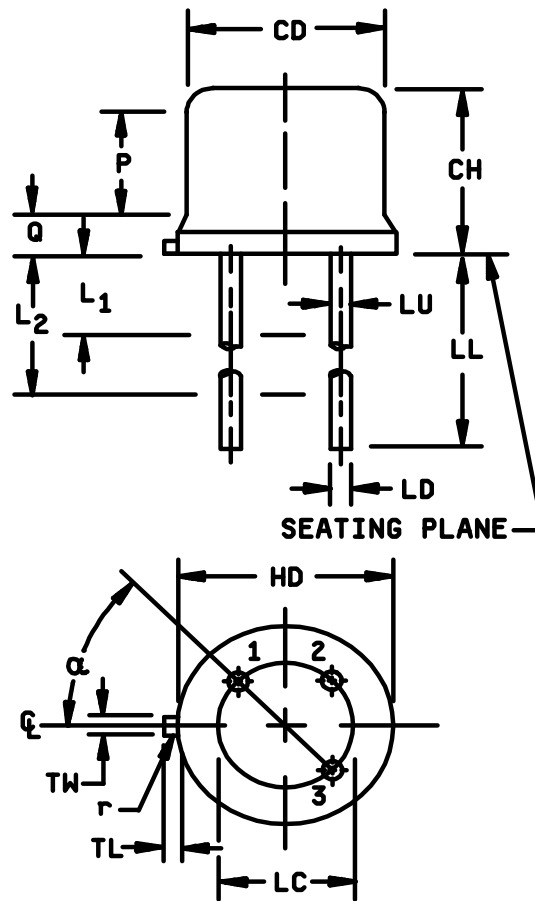


NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. This zone is controlled for automatic handling. The variation in actual diameter within this zone shall not exceed .010 inch (0.254 mm).
4. (Three leads) LU applies between L_1 and L_2 . LD applies between L_2 and .5 inc (12.70 mm) from seating plane. Diameter is uncontrolled in L_1 and beyond .5 inch (12.70 mm) from seating plane.
5. Measured from maximum diameter of the actual device.
6. Details of outline in this zone optional.
7. The collector shall be electrically connected to the case.
8. Lead number 1 - emitter; lead number 2 - base; lead number 3 - collector.
9. All 3 leads.
10. In accordance with ANSI Y14.5M, diameters are equivalent to Φ x symbology.

FIGURE 1. Physical dimensions (TO-18).

Symbol	Dimensions				Notes
	Inches		Millimeter		
	Min	Max	Min	Max	
CH	.240	.260	6.10	6.60	
LC	.200 TP		5.08 TP		7
LD	.016	.021	0.41	0.53	8,9
LL	See notes 12, and 13				
LU	.016	.019	0.41	0.48	8,9
L ₁		.050		1.27	8, 9
L ₂	.250		6.35		8, 9
HD	.355	.370	8.51	9.40	
CD	.305	.335	7.75	8.51	
h	.009	.041	0.23	1.04	
P	.100		2.54		6
Q		.050		1.27	5
r		.010		0.25	
TL	.029	.045	0.74	1.14	4
TW	.028	.034	0.71	0.86	0.71
α	45° TP		45° TP		7



NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Beyond r (radius) maximum, TW shall be held for a minimum length of 0.011 inch (0.28 mm).
4. TL measured from maximum HD.
5. Outline in this zone is not controlled.
6. CD shall not vary more than .010 inch (0.25 mm) in zone P. This zone is controlled for automatic handling.
7. Leads at gauge plane .054 +.001, -.000 inch (1.37 +0.03, -0.000 mm) below seating plane shall be within .007 inch (0.18 mm) radius of true position (TP) at a maximum material condition (MMC) relative to the tab at MMC. The device may be measured by direct methods or by the gauge and gauging procedure described on gauge drawing on figure 2.
8. LU applies between L₁ and L₂. LU applies between L₂ and LL minimum. Diameter is uncontrolled in L₁ and beyond LL minimum.
9. All three leads.
10. The collector shall be electrically and mechanically connected to the case.
11. r (radius) applies to both inside corners of tab.
12. For transistor types 2N1613, dimension LL is .500 inch (12.70 mm) minimum, and .750 inch (19.05 mm) maximum.
13. For transistor types 2N1613L, dimension LL is 1.500 inches (38.10 mm) minimum, and 1.750 inches (44.45 mm) maximum.
14. Lead number 1 - emitter; lead number 2 - base; lead number 3 - collector.

FIGURE 2. Physical dimensions (similar to TO -5 and TO -39).

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3.5. Interface and physical dimensions. The design, construction and physical dimensions shall be as specified on figures 1 and 2 herein.

3.5.1. Lead finish. Lead finish shall be solderable as defined in MIL-STD-750, MIL-PRF-19500 and herein. Where a choice of lead finish is desired, it shall be specified in the acquisition document (see 6.2).

3.6. Marking. Marking shall be in accordance with MIL-PRF-19500.

3.7. Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in 1.3, 1.4, and table I.

3.8. Electrical test requirements. The electrical test requirements shall be the subgroups specified in Table I herein.

4. VERIFICATION

4.1. Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see 4.2).
- b. Screening (see 4.3)
- c. Conformance inspection (see 4.4).

4.2. Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-19500.

4.3. Screening (JANTX and JANTXV levels only). Screening shall be in accordance with MIL-PRF-19500 (table IV), and as specified herein. The following measurements shall be made in accordance with table I herein. Devices that exceed the limits of table I herein shall not be acceptable.

Screen (see table IV of MIL-PRF-19500)	Measurement
	JANTX and JANTXV levels
3c	Thermal impedance (see 4.3.2)
9	Not applicable
10	48 hours minimum
11	I_{CBO2} , h_{FE3}
12	See 4.3.1 80 hours minimum
13	Subgroup 2 of table I herein; $\Delta I_{CBO2} = 100\%$ of initial value or 5 nA dc, whichever is greater; $\Delta h_{FE3} = \pm 15\%$

4.3.2. Power burn-in conditions. Power burn-in conditions are as follows: $V_{CB} = 10 - 30$ Vdc. Power shall be applied to achieve $T_j = 135^\circ\text{C}$ minimum and a minimum $P_D = 75\%$ of P_T maximum rated as defined in #1.3.

4.3.2 Thermal impedance ($Z_{\theta JX}$ measurements) (for qualification only). The $Z_{\theta JX}$ measurements shall be performed in accordance with MIL-STD-750, method 3131.

- a. I_M measurement current 5 mA.
- b. I_H forward heating current 50 mA.
- c. t_H heating time 5 ms
- d. t_{MD} measurement delay time 100 μs maximum.

The maximum limit for $Z_{\theta JX}$ under these conditions are $Z_{\theta JX}$ (maximum) = 75°C/W ."

4.4. Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500, and as specified herein. If alternate screening is being performed per MIL-PRF-19500, a sample of screened devices shall be submitted to and pass the requirements of group A1 and A2 inspection only (table VIb, group B, subgroup 1 is not required to be performed again if group B has already been satisfied per 4.4.2).

4.4.1. Group A inspection. Group A inspection shall be conducted in accordance with MIL-PRF-19500, and table I herein.

4.4.2. Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in 4.4.2.2 for JAN, JANTX, and JANTXV group B testing. Electrical measurements (end-points) and delta requirements for JAN, JANTX, and JANTXV shall be after each step in 4.4.2.2 and shall be in accordance with group A, subgroup 2 and 4.5.3 herein.

4.4.2.2. Group B inspection, (JAN, JANTX, and JANTXV). Separate samples may be used for each step. In the event of a group B failure, the manufacturer may pull a new sample at double size from either the failed assembly lot or from another assembly lot from the same wafer lot. If the new "assembly lot" option is exercised, the failed assembly lot shall be scrapped.

Step	Method	Condition
1	1039	Steady-state life: Test condition B, 340 hours, $V_{CB} = 10 - 30$ V dc, Power shall be applied to achieve $T_j = +150^\circ\text{C}$ minimum and a minimum of $P_D = 75\%$ of maximum rated P_T as defined in #1.3. $n = 45$ devices, $c = 0$
2	1039	The steady state life test of step 1 shall be extended to 1,000 hours for each die design. Samples shall be selected from a wafer lot every twelve months of wafer production. Group B step 2 shall not be required more than once for any single wafer lot. $n = 45$, $c = 0$.
3	1032	High-Temperature life (non-operating), $T_A = +200^\circ\text{C}$. $n = 22$, $c = 0$, $t = 340$ hours

4.4.2.3. Group B sample selection. Samples selected from group B inspection shall meet all of the following requirements:

- a. For JAN, JANTX, and JANTXV samples shall be selected randomly from a minimum of three wafers (or from each wafer in the lot) from each wafer lot. See MIL-PRF-19500.
- b. Must be chosen from an inspection lot that has been submitted to and passed group A, subgroup 2, conformance inspection. When the final lead finish is solder or any plating prone to oxidation at high temperature, the samples for life test (group B for JAN, JANTX, and JANTXV) may be pulled prior to the application of final lead finish.

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4.4.3. Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in table VII of MIL-PRF-19500, and 4.4.3.1 herein for group C testing. Electrical measurements (end points) and delta requirements shall be in accordance with group A, subgroup 2 and 4.5.3 herein

4.4.3.1. Group C inspection, appendix E, table VII of MIL-PRF-19500.

Subgroup	Method	Conditions
C2	2036	Test condition E.
C6	1026	Not applicable

4.4.4. Group E Inspection. Group E inspection shall be performed for qualification or re-qualification only. The tests specified in table III herein must be performed to maintain qualification.

4.5. Method of inspection. Methods of inspection shall be as specified in appropriate tables and as follows.

4.5.1. Pulse measurements. Conditions for pulse measurements shall be as specified in section 4 of MIL-STD-750.

4.5.2. Thermal resistance. Thermal resistance measurements shall be conducted in accordance with method 3131 of MIL-STD-750 (for qualification only). The following details shall apply:

- Collector current magnitude during power applications shall be 28 mA dc (2N718A), and 47 mA dc (2N1613 and 2N1613L).
- Collector to emitter voltage magnitude ≥ 20 V dc.
- Reference temperature measuring point shall be the case.
- Reference point temperature shall be $+25^{\circ}\text{C} \leq T_R \leq +75^{\circ}\text{C}$ and recorded before the test is started.
- Mounting arrangement shall be with heat sink to case.
- Maximum limit shall be $R_{\theta JC} = 97^{\circ}\text{C/W}$ (2N718) and 58°C/W (2N1613 and 2N1613L).

4.5.3. Delta Requirements. Delta requirements shall be as specified below:

Step	Inspection	MIL-STD-750		Symbol	Limit	Unit
		Method	Conditions			
1	Collector-base cutoff current	3036	Bias condition D, $V_{CB} = 60$ V dc	ΔI_{CB02} See note 1	100% of initial value or 5 nA dc, whichever is greater.	
2	Forward current transfer ratio	3076	$V_{CE} = 10$ V dc; $I_C = 150$ mA dc; pulsed see 4.5.1	Δh_{FE3} See note 1	$\pm 25\%$ change from initial reading.	

NOTE:

- Devices which exceed the group A limits for this test shall not be accepted.

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TABLE I. Group A inspection

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1 2/</u>						
Visual and mechanical <u>3/</u> examination	2071	n = 45 devices, c = 0				
Solderability <u>3/</u>	2026	n = 15 leads, c = 0				
Resistance to solvents <u>3/</u> , <u>4/</u> , <u>5/</u>	1022	n = 15 devices, c = 0				
Temp Cycling <u>3/</u>	1051	Test condition C, 25 cycles. n = 22 devices, c = 0				
Hermetic Seal Fine leak Gross leak	1071	n = 22 devices, c = 0				
Electrical measurements		Group A, subgroup 2				
Bond strength <u>3/</u>	2037	Precondition T _A = +250°C at t = 24 hrs or T _A = +300°C at t = 2 hrs n = 11 wires, c = 0				
<u>Subgroup 2</u>						
Collector-to-base cutoff current	3036	Bias condition D, V _{CBO} = 75 V dc pulsed (see 4.5.1)	I _{CBO1}		10	μA dc
Emitter to base cutoff current	3061	Bias condition D; V _{EBO} = 7 V dc pulsed (see 4.5.1)	I _{EBO1}		10	μA dc
Breakdown voltage, collector-emitter	3011	Bias condition D; I _C = 100 μA dc; pulsed (see 4.5.1)	V _{(BR)CEO}	30		V dc
Breakdown voltage collector-emitter	3011	Bias condition D, I _C = 100 μA dc, pulsed (see 4.5.1), R _{BE} = 10 Ω	V _{(BR)CER}	50		V dc
Collector to base cutoff current	3036	Bias condition D, V _{CB} = 60 V dc	I _{CBO2}		10	nA dc
Emitter-base cutoff current	3061	Bias condition D, V _{EB} = 5 V dc	I _{EBO2}		10	nA dc
Collector-emitter saturated voltage	3071	I _C = 150 mA dc, I _B = 15 mA dc, pulsed (see 4.5.1)	V _{CE(sat)1}		1.5	V dc
Base-emitter saturated voltage	3066	Test condition A, I _C = 150 mA dc, I _B = 15 mA dc, pulsed (see 4.5.1)	V _{BE(sat)1}		1.3	V dc
Forward-current transfer ratio	3076	V _{CE} = 10 V dc, I _C = 0.1 mA dc, pulsed (see 4.5.1)	h _{FE1}	20		
Forward-current transfer ratio	3076	V _{CE} = 10 V dc, I _C = 10 mA dc, pulsed (see 4.5.1)	h _{FE2}	35		

See footnotes at end of table.

TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 2</u> - Continued						
Forward-current transfer ratio	3076	$V_{CE} = 10 \text{ V dc}$; $I_C = 150 \text{ mA dc}$ pulsed (see 4.5.1)	h_{FE3}	40	120	$\mu\text{A dc}$
Forward-current transfer ratio	3076	$V_{CE} = 10 \text{ V dc}$; $I_C = 500 \text{ mA dc}$, pulsed (see 4.5.1)	h_{FE4}	20		
<u>Subgroup 3</u>						
High temperature operation:		$T_A = +150^\circ\text{C}$				
Collector to base cutoff current	3036	Bias condition D, $V_{CB} = 60 \text{ V dc}$	I_{CBO3}		10	
Low temperature operation		$T_A = -55^\circ\text{C}$				
Forward-current transfer ratio	3076	$V_{CE} = 10 \text{ V dc}$, $I_C = 10 \text{ mA dc}$, pulsed (see 4.5.1)	h_{FE5}	20		
<u>Subgroup 4</u>						
Small signal short circuit forward current transfer ratio	3206	$V_{CE} = 5 \text{ V dc}$, $f = 1 \text{ kHz}$, $I_C = 1 \text{ mA dc}$:	h_{fe}	30	100	
		$V_{CE} = 10 \text{ V dc}$, $f = 1 \text{ kHz}$, $I_C = 5 \text{ mA dc}$	h_{fe}	35	150	
Magnitude of common emitter small-signal short-circuit forward-current transfer ratio	3306	$V_{CE} = 10 \text{ V dc}$, $f = 20 \text{ MHz}$, $I_C = 50 \text{ mA dc}$	$ h_{fe} $	3		
Small signal short circuit input impedance	3201	$V_{CB} = 10 \text{ V dc}$, $f = 1 \text{ kHz}$, $I_C = 5 \text{ mA dc}$	h_{ie}	4	8	ohms
Small signal short circuit output admittance	3216	$V_{CB} = 10 \text{ V dc}$, $f = 1 \text{ kHz}$, $I_C = 5 \text{ mA dc}$	h_{oe}	0	1.0	$\mu \text{ ohms}$
Small signal open circuit reverse voltage transfer ratio	3211	$V_{CB} = 10 \text{ V dc}$, $f = 1 \text{ kHz}$, $I_C = 5 \text{ mA dc}$	h_{re}		3×10^{-4}	
Open circuit output capacitance	3236	$V_{CB} = 10 \text{ V dc}$, $I_E = 0$, $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	C_{obo}		25	pF
Pulse response	3251	Test condition A, except test circuit and pulse requirements. See figure 3 herein.	$t_{on} + t_{off}$		30	ns

See footnotes at end of table.

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TABLE I. Group A inspection - Continued.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroups 5 and 6</u> Not applicable <u>Subgroup 7 <u>2/</u></u> Decap internal visual (design verification)	2075	n = 1 device, c = 0				

1/ For sampling plan, see MIL-PRF-19500.2/ For resubmission of failed subgroup A1, double the sample size of the failed test or sequence of tests.TABLE II. Group E inspection (all quality levels) - For qualification only

Inspection	MIL-STD-750		Qualification
	Method	Conditions	
<u>Subgroup 1</u> Temperature cycling (air to air) Hermetic seal Fine leak Gross leak Electrical measurements	1051 1071	Test condition C, 500 cycles See group A, subgroup 2 and 4.5.3 herein.	12 devices c = 0
<u>Subgroup 2</u> Intermittent life Electrical measurements	1037	Intermittent operation life: $V_{CB} = 10 \text{ V dc}$, 6,000 cycles, $\Delta T_J \geq +100^\circ\text{C}$; forced air cooling allowed on cooling cycle only. See group A, subgroup 2 and 4.5.3 herein.	45 devices c = 0
<u>Subgroup 3</u> Not applicable			
<u>Subgroup 4</u> Not applicable			
<u>Subgroup 5</u> Not applicable			

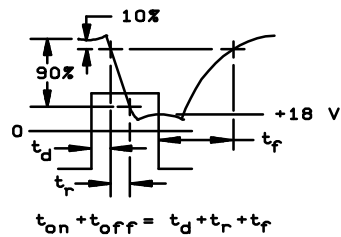
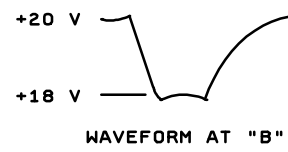
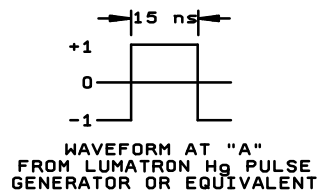
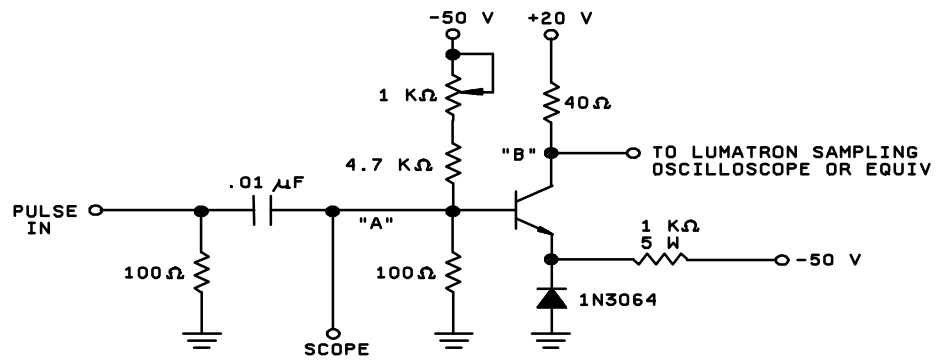


FIGURE 3. Pulse response (turn-on plus turn-off) measurement circuit and waveforms.

5. PACKAGING

5.1. Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1. Notes. The notes specified in MIL-PRF-19500 are applicable to this specification.

6.2. Acquisition requirements. See MIL-PRF-19500.

6.3. Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List QPL No.19500 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Defense Supply Center Columbus, ATTN: DSCC-VQE, 3990 East Broad Street, Columbus, OH 43216-5000.

6.4. Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

CONCLUDING MATERIAL

Custodians:

Army - CR
Navy - EC
Air Force - 11
NASA - NA
DLA - CC

Preparing activities:

DLA - CC

(Project 5961-2057)

Review activities:

Army - AR, AV, MI, SM
Navy - AS, CG, MC
Air Force - 13, 19, 99

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:**1. DOCUMENT NUMBER**

MIL-PRF-19500/181G

2. DOCUMENT DATE (YYMMDD)

000616

3. DOCUMENT TITLE SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, LOW-POWER TYPES 2N718A, 2N1613, AND 2N1613L, JAN, JANTX AND JANTXV

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